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# CASE STUDIES OF EDI USED BY NORTH AMERICAN TELECOMMUNICATIONS CARRIERS

*For*

NTT

## FINAL REPORT

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CASE STUDIES  
OF EDI USED  
BY N.A. TELE  
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# **CASE STUDIES OF EDI USED BY NORTH AMERICAN TELECOMMUNICATIONS CARRIERS**

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# **I Introduction**

## **A Purpose and Scope**

The purpose of this study is to provide a detailed review of how EDI is used by North American carriers. More specifically, to identify those carriers that do or plan to interface with customers and perform telephone billing transactions via EDI.

## **B Methodology**

This report was compiled by conducting multiple telephonic and personal interviews and reviewing recent published data on telephone billing via EDI. The approach used of the interviews was based on the project specification provided by NTT in August, 1991.

Throughout this report the term "carriers" is used to refer to the companies interviewed for this project. They are all independent providers of telephone services within the U.S. The carriers surveyed are as follows:

- Bell Atlantic (BA)
- Cincinnati Bell (CB)
- NYNEX (NY)
- Pacific Bell (PB)
- US West (USW)

Each of these companies agreed to provide the information contained in this report with the understanding that it would be used by INPUT and its clients on a confidential basis. Where permitted by the respondent the findings are attributed to the specific company. **The information is provided to NTT for their explicit use.**

## **C Report Organization**

Following the Introduction, the report is made up of eight major areas and generally complies with the organizational requirements provided by NTT. The reader is referred to the table of contents for the title of each section or chapter.





It is recommended that the reader also refer to the questionnaire when reviewing the research findings. Each section is structured and numbered the same as the interview questionnaire.



## II EXECUTIVE SUMMARY

### EDI Telephone Billing

All carriers are aware of the recently approved ANSI X12 811 draft standard transaction set which outlines how telephone billing can be accomplished via EDI. Two of the carriers interviewed have key staff who are chairpersons that lead this standard committee.

The 811 standard is the largest and most complex of all standards which leads some to believe that it will slow customer acceptance.

None of the carriers have customers using this standard today. Although, all carriers plan to use it to support their major customers over the next 5 years.

### Other EDI Activities

All carriers were reluctant to define the details of their EDI system and network specifications for reasons of propriety. It is important to note that at least one carrier will use a value added network (VAN) services provider to deal with the problems of protocol conversion and interface as opposed to using their own networking capabilities.

All of the carriers use standard formats and plan to connect with between 5 to 10 trading partners during 1992. Also, all carriers will use ANSI X12 and those with international business connections will support EDIFACT.

While only one carrier is using MHS X.400 today, almost all plan to implement it -- possibly over the next 2 years. In contrast, no carrier has any plans to offer FTAM.





### III EDI Billing Function

This section provides the findings from Section I of the questionnaire. It discusses the carrier's beliefs concerning the interest and willingness to make the effort to introduce electronic (EDI-based) billing of general telephone services.

- 1a All carriers agree that corporate customers would prefer to receive their telephone bills through an EDI format. The larger and national customers would be the typical customer.
- 1b This is because:
  - The customer's business could be streamlined through reduction of paper and better utilization of staff and resources.
  - Customers are asking for the service.
  - Deregulation has increased emphasis on this growing corporate expense.
  - The increase in the number of service providers, in particular for long distance services, has increased the emphasis on this corporate expense.
- 2 **Number of customers** - Less than 1% of the carrier's corporate customers (as few as 5 to 35 customers) would prefer an EDI-based telephone billing service today. Yet the bill provided to these customers is so large that they are demanding electronic billing. Typically 3% of an RBOCs customers represented 50% of the total billing for general telephone services.
- 3 **Current use** - No customers of any of the carriers surveyed are currently using it to pay their telephone bills.
- 4 **Potential use** - From 30 to 2,500 customers of a given carrier could be using this service 5 years from now based on the range of responses from the five carriers interviewed. This range suggests that the appeal of electronic telephone billing beyond the largest of a carrier's customers is unknown.
- 5a **Willingness to invest** - The carriers indicated that between none and two-thirds of these customers would prefer to combine the expense of starting up an EDI system to process telephone bills with some other EDI effort. It might be concluded that the customer is not willing to expend funds to initiate or operate EDI telephone billing, but expects the carrier to incur the expense.
- 5b A majority (97%) of these customers would utilize the store and forward format (MHS). This is based on intent to adopt 811 and use store and forward transmission.





- 6 Eighty percent (80%) of the carriers thought that customers who already had their own EDI system in place would be more willing to go through the expense of starting up an EDI system to process telephone bills.
- 7 **Assessment of 811** - The carriers assessment of the DISA/ANSI ASC X12 811 draft standard transaction set which allows telephone companies to send their bills to customers via EDI indicates:
  - It meets the needs of the service providers (possibly including insurance and healthcare industries as well).
  - It is the largest, most complex, (yet flexible) standard of all approved transaction sets, e.g., there are 9 different ways to bill a customer, for example, division, department, or location, etc.
  - Problems of customer acceptance, education, and support are anticipated due to complexity. While it is a good standard, it needs more carrier access billing (CAB) features to be complete.
- 8 The majority agreed that it would be valuable to couple an electronic EDI billing services with a Call Detail Recording (telemangement) system.
  - Customers could analyze their usage and costs from the 811 transaction set, however the volume of data that could be provided suggests that the existing deliver form, that is magnetic tape, may continue to be appropriate. The summary data would of course be delivered electronically through EDI with the 811 transaction set.
  - The Telephone Bill Work Group, part of the 811 committee, will review the potential for this area to become a separate transaction set. Meetings to review this topic are scheduled for first quarter of 1992.



## IV General System Information & OSI Reference Model

This section reports the findings from Section II of the questionnaire. It discusses the status of EDI-based billing systems.

- 1 **Current status** - Most of those surveyed were reluctant to give out many details or discuss their EDI system specifications. Only one provided a high-level block diagram, depicting the flow and detail of information exchanged within their EDI service. Below are the responses by carrier.

**BELL ATLANTIC:** Example provided of commercial offering (see attached diagram).

**CINCINNATI BELL:** provided the following verbal description of the EDI based telephone billing service to go into pilot in 1992.

1. Central office switch collects billing data through it's message processing system.
2. Generates the Customer Records Information System (CRIS) as well as new equipment through the service order system.
3. CRIS combines all data.
4. EDI intercepts formatted CRIS data and forwards to VAN for formatting, distribution, and delivery to user.
5. VAN (KLEINSCHMIDT) provides inexpensive translation to 811 standard. The VAN makes its revenue on distribution not translation.
6. All EDI processes would occur as often as 20 times per month. Typically, 1 bill per month would be generated however very large customers could get 5 or 6 bills per month. For example, PROCTOR AND GAMBLE.

**NYNEX:** is doing P.O. (850), EFT (820), and order acknowledgment (997) EDI systems today. However, they are not doing EDI based telephone service billing. No other descriptions were provided. Note see Appendix D for descriptions of these standards.

**PACBELL:** indicated the subject is under study but were not able to discuss it at this time.

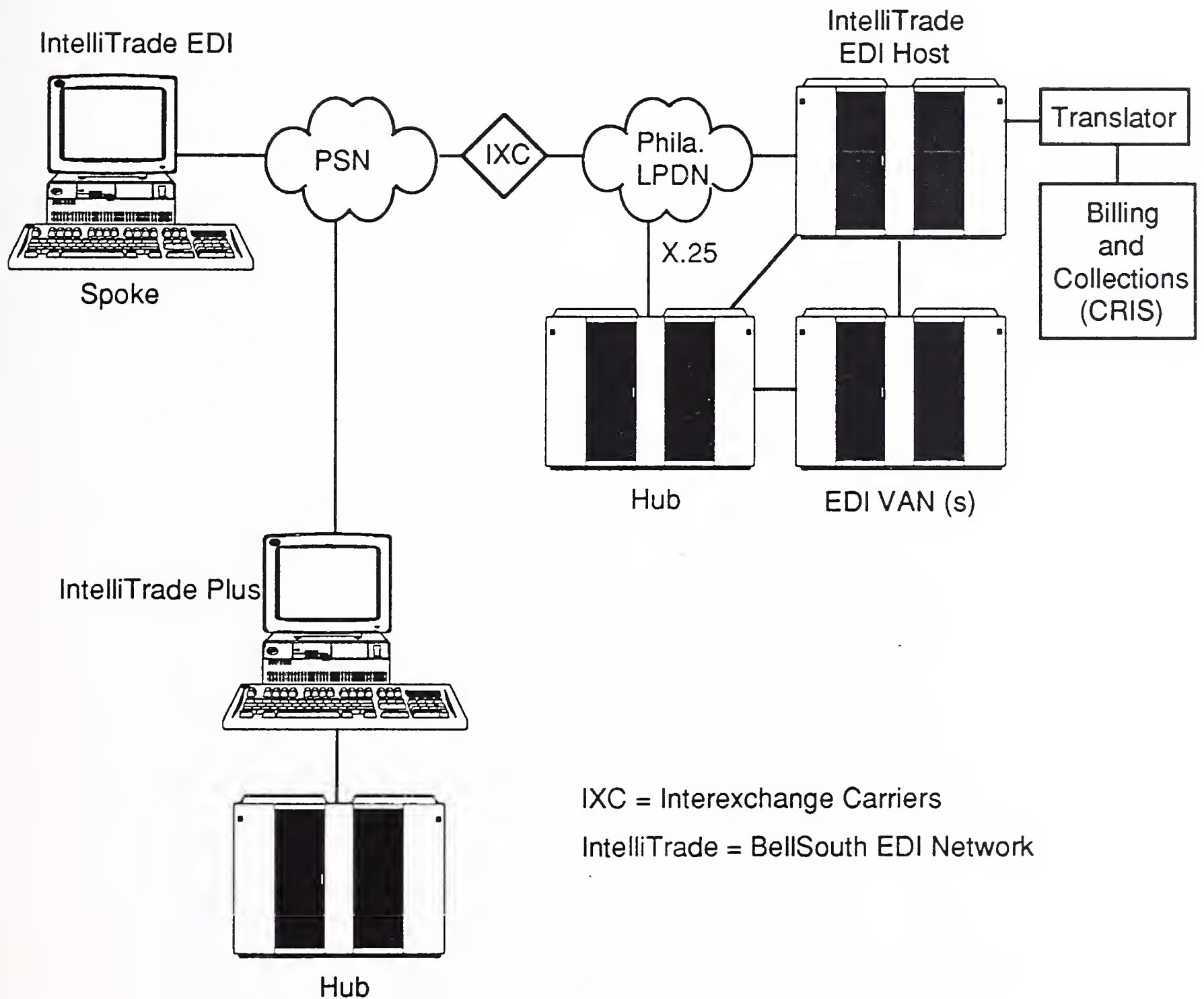
**US WEST:** indicated the subject is under study but were not able to discuss it at this time.

- 2 **System configuration** - The majority would not disclose the configuration of their EDI billing system/network. Cincinnati Bell gave a cryptic description indicating a mainframe through IBM's packet network to a Kleinschmidt VAN to their customers (as described above).





## Bell Atlantic's IntelliTrade EDI Network Configuration







- 3a **Testing and potential** - Two carriers said testing is underway but neither has customers currently utilizing their EDI billing system network.
- 3b **No user restrictions** - The maximum number of users that could be supported by each EDI network system was, essentially, unknown. No restrictions are anticipated but the volume of billing under the 811 transaction set information could cause the carrier to expand its base processing capability to support EDI billing services. Thus as noted previously the carrier as well as the customers may suggest continuing to receive the detail data via magnetic tape.
- 4a **OSI Basic Reference Model** - Using the OSI Basic Reference Model, the following diagrams depict the top 3 transfer (access) protocols currently supported. Several respondents were not familiar with this area and indicated that the business issues related to launching an EDI billing service were of greater importance. They know they can turn to a VAN for the technology if required.

BA	OSI Ref. Model	Example 1	Example 2
	Application		
	Presentation		
	Session		
	Transport		
	Network	X.25	PSN
	Data Link	PADS	?
	Physical	MODEM	MODEM
CB	OSI Ref. Model	Example 1	
	Application		
	Presentation		
	Session		
	Transport	(Kleinschmidt VAN)	
	Network	X.25	
	Data Link	HDLC	
	Physical		
NY	OSI Ref. Model	Example 1	
		Declined to respond - too early	
	Application		
	Presentation		
	Session		
	Transport		
	Network		
	Data Link		
	Physical		



<b>PB</b>	<b>OSI Ref. Model</b>	<b>Example 1</b>
	Application	
	Presentation	
	Session	
	Transport	
	Network	(Sears VAN linked to TANDEM based ORDERNET)
	Data Link	
	Physical	

<b>USW</b>	<b>OSI Ref. Model</b>	<b>Example 1</b>
	Application	Proprietary-declined to respond
	Presentation	
	Session	
	Transport	
	Network	
	Data Link	
	Physical	

- 4b **Top protocols** - None of the respondents could rank the top 3 protocols because it was too soon in the development stage to have definitive data. At least one carrier was using a VAN as a primary interface thus eliminating protocols as an area of concern at this stage of development.
- 5a **Charge for service** - Carriers were divided on the subject of charging for this service. Some expect to charge and others believe the customers will object to such a charge. The area is being addressed but it is still too early to know. One carrier indicated that relatively small VAN usage charges would be incurred by the customer regardless if the carrier charged for the billing service.
- 5b **Service Pricing** - No one would provide a copy of their pricing schedules or anything that gave an approximation of what a user might pay for network services. One of the interviewed carriers speculated that Southwestern Bell and Southern New England Bell were not planning to charge for services. (Note these two carriers were not part of the interview sample).
- 6 **Problems and resolution** - Some of the more significant problems being experienced with EDI billing systems (or other EDI systems) and corrective methods or approaches are noted as follows:
- One carrier indicated that due to the complexity and difficulty in interpreting and translating Carrier Record Information Systems (CRIS) to EDI, the CRIS will be replaced in 2 to 4 years and will incorporate EDI capabilities.





- Using the 811 standard one other carrier cited difficulty in working with detailed call data. They have been successful in passing summary billing by EDI under the 811 standard. Magnetic tape containing detailed level data, which has been provided on a periodic basis for sometime, can continue to provide a means of performing detailed audit and control. However this means the customer receives its telephone billing data from two sources.
- There will be a need for third party software and support from vendors and consultants to facilitate customer understanding of the 811 standard and how to deal with large amounts of detailed data that will be provided. The existing telephone billing analysis systems (often referred to as Customer Records Information System - CRIS) will have to be re-engineered to the 811 standard. This may prove to be a significant task for the software vendors and may increase the cost of the software used by customers of carriers to analyze telephone expenses.



## V Business Formats - Billing Systems, Only

This section reports the findings from Section III of the questionnaire. It discusses the use of business protocols relative to EDI-based electronic billing systems.

- 1 **Business formats use** - Sixty percent (60%) use only standard EDI formats which include ANSI X12, EDIFACT, TDCC, WINS, UCS, Petrodex, UB82, and the various implementations of these defined by industry-specific implementation guidelines. Forty percent (40%) use both proprietary and standard EDI protocols. No one uses only proprietary EDI protocols.
- 2 **Proprietary versus standard formats** - Those who were planning to use both proprietary and standard formats, estimated the relative proportions of each in terms of total data traffic sent to and from their trading partners. While the data is largely inconclusive, the two respondents indicated that up to 20% would be sent via proprietary formats and with the remainder being sent via standard formats. In general the EDI activity is moving towards use of standards-based formats in all areas.
- 3 **Number of active trading partners** - As reported above no carrier was found to have implemented an EDI-based electronic billing system. One respondent did indicate that they had a single trading partner with whom they are using a standard EDI format to transmit summary billing data.
- 4 Two carriers indicated that they would have between 5 to 10 trading partners in the next 12 months and would interface with them using standard protocols. Two other respondents indicated that it was premature to indicate what type of protocol or format would be used.

It should be noted, however, that significant growth could occur as a result of the recent favorable court ruling by Judge Green allowing carriers to perform processing and protocol conversion. This judgment opens the general information processing services area to the carriers who are expected to become more aggressive in providing and charging for processing services in a number of related activities.. Electronic telephone services billing is just one such activity.





## VI Formats - All Other Systems

- 1 Carriers use the following EDI applications. Some carriers were more specific than others in identifying which type of format is used.

<b>BA Application</b>	<b>Standard</b>	<b>Proprietary</b>
PO's to suppliers	X12	
PO's from customers		
Invoices from suppliers	X12	
Invoices to customers		
Transportation documentation (ship notices, etc.)		
Payments to/from trading Partners		
Other:		
MATERIAL MGMT ORG..PO TO SUPPLIER	X12	
AND INVOICE FROM SUPPLIER	X12	

<b>CB Application</b>	<b>Standard</b>	<b>Proprietary</b>
PO's to suppliers	X12	
PO's from customers	X12	
Invoices from suppliers	X12	
Invoices to customers	X12	
Transportation documentation (ship notices, etc.)		
Payments to/from trading Partners		
Other:		
ORDER ACKNOWLEDGMENTS FROM SUPPLIERS	X12	

<b>NY Application</b>	<b>Standard</b>	<b>Proprietary</b>
PO's to suppliers	Declined to discuss	
PO's from customers		
Invoices from suppliers		
Invoices to customers		
Transportation documentation (ship notices, etc)		
Payments to/from trading Partners		
Other		



<b>PB Application</b>	<b>Standard</b>	<b>Proprietary</b>
PO's to suppliers	YES	
PO's from customers		
Invoices from suppliers	YES	
Invoices to customers	YES	
Transportation documentation (ship notices, etc		
Payments to/from trading Partners	YES	
Other		
<b>USW Application</b>	<b>Standard</b>	<b>Proprietary</b>
PO's to suppliers	YES	
PO's from customers	YES	
Invoices from suppliers	YES	
Invoices to customers	YES	
Transportation documentation (ship notices, etc.)		
Payments to/from trading Partners	YES	YES
Other:		
Invoicing, Call Detail, Ordering, Inventory, & Settlements		YES

- 2 Two carriers do not plan to use EDIFACT because they do not participate in the international market.
- 3 All carriers plan to use X12 to interconnect with another vendor. One indicated all applicable standards including X12 would be used.



## VII Current Status of Protocols

This section discusses general status of protocols relative to all EDI activity by the responding carriers, not just electronic telephone billing. The questions used are in Section V of the questionnaire.

- 1a **Transfer protocol interface** - Sixty percent of the respondents use VANs to perform their EDI transfer protocol interface. Another carrier is using X.25 via the Public Switched Network (PSN).
- 1b **Selection of protocol** - Two of the 5 indicated that the current approach to transfer protocol is customer driven -- the only other respondent said it was strategy driven.
- 2 **Protocol related problems** - Little indication of general problems were reported. Two did not think there were any problems with the protocols.

It was noted earlier that one carrier was having problems with the detailed level data within the 811 standard for telephone billing.

- 3 **Protocols offerings** - Most carriers indicated that it was too soon to make a general assessment and that they currently use VANs for their active EDI applications. Like many industries, the EDI activity to date has been focused on the purchase order and invoice. Until more experience is gained in the billing area, the respondents will have little to say concerning protocol selection.

One indicated that X.25 and the public switched network are highly functional although the method could be more secure.

- 4 The question requesting the number of companies using each protocol and identification of larger users was inconclusive. Again, it must be noted that most current EDI activity by these carriers is conducted through VANs.
- 5 **MHS use** - Only one carrier could respond to the question of whether they are offering MHS protocol and they are still in a test mode. The use is tied to their piloting of the 811 standard for telephone billing:
  - a The version of MHS protocol used is 84
  - b The type of protocol used (P0, P1, P2, P3, or P7) is unknown.
  - c MHS (X.400) protocol is currently used with one customer
  - d MHS protocol is not used with network services vendors
- 6 **FTAM use** - No one offers FTAM protocol nor were they aware of which types of file options could be used (Type 1, 2, or 3).





- 7 All interconnected with other EDI networks using X.25 packet switching. Interconnected networks included BT Tymnet, IBM Information Network, AT&T, Sears, Ordernet from Sterling Software, and GEIS.



## VIII Future Trends of Protocols

This section discusses the respondents comments on the future direction of protocols in particular relative to the billing standard.

- 1a **Future EDI protocol interfaces** - The following EDI transfer protocol interfaces are expected to be offered to users and other service vendors. The following responses represent the diversity of current thinking:
- Interface through VANs only
  - Mailbag will be used as an interim solution to X.435 -- X.435 to activate in 1992 or later
  - Will use X.400--Bisync used today
  - SONET, FDDI, and SMDS to be used for large volumes
- 1b Reasons for the diversity of current thinking on future protocol offerings include:
- Store and forward functionality, ease of interconnection, X.500 directory services, security (confirmation of message receipt), and ability to send X12 document in an X.400 envelope.
  - It is just too soon to know
  - Customers insisting on X.400
  - Customer service to a diverse customer base.
- 2 **Expected availability** - The scheduled roll out for these offerings will be:
- Mailbag is due 2nd quarter, 1992 and X.435 in 1992 or 93
  - Too soon to know
  - Unknown -- tests underway with FDDI and SMDS
- 3a **MHS use and timing** - Planned use of MHS protocol included the following responses.
- 2 planned to use
  - 1 indicated no plans
  - 1 did not know
  - 1 did not apply -- currently using VAN
- 3b Of the two carriers planning to use MHS one indicated the first quarter of 1992 and the other sometime in 1993.





- 4a **MHS versions** - The 2 carriers planning to offer MHS protocol will use the 1988 version.
- 4b Only one carrier knew which type of protocol would be used. All of the following would be used: P0, P1, P2, and P3.
- 4c Both carriers plan to use MHS with specific customers. One indicated they would use MHS with large customers, only.

The other carrier would use MHS with one customer and currently anticipates the others will interact via VANs. This carrier is targeting 35 customers in its startup project for electronic telephone billing.

- 4d Both will use MHS protocol with generally all network services vendors for reasons driven, primarily, by customer demand.

- 5a **FTAM offering** - No one is planning to offer FTAM

- 6 Other comments include:

- A concern was raised about the cost to implement the 811 specification. Its use must be accepted internally and some internal systems work will be required to meet the objective of decreasing telephone expenses.
- The one carrier planning the exclusive use of VANs would consider doing an in-house (direct) interface (perhaps MHS) when they get 50 customers. They are anticipating a cost of \$150,000 to install an in-house interface with customers.



## **IX Conclusions**

### **EDI Billing Functions**

- DISA/ANSI X12 811 draft standard transaction set was approved in June, 1991
- It is the largest and most complex of all standards. Due to this complexity customers may be slow to accept it.
- Less than 1% of a given carrier's customers would use it. However, approximately 3% of a carrier's customers generate 50% of the revenue.
- While no customers are currently using 811, carriers estimate that between 30 and 2,500 could be using it within 5 years.
- A majority of these customers would use the store and forward format.

### **General Systems Information**

- Carriers were reluctant to give out details of their EDI system and network specifications. Diagrams provided were lacking in detail.
- Two carriers indicated that they are conducting EDI billing system tests with customers.
- OSI Reference Model information was very limited for reasons of propriety. One carrier was using a VAN to address the communication protocol issues. This approach allowed the carrier to focus on the development of business formats.
- Pricing schedules were considered proprietary.
- Problems included difficulty in interpreting CRIS records into EDI, difficulty in working detailed level data, and a need exists for third party software support.

### **Formats - Billing Systems Only**

- All carriers use standard formats and a few support both standard and proprietary.
- Number of trading partner estimates varied between unknown to 5 or 10 over the next year.
- Potential for significant growth was noted due to the recent favorable court ruling allowing carriers to perform processing and protocol conversion.



### **Formats - All Other Systems**

- All carriers plan to use X12 to interconnect with another vendor.
- Two carriers will not use EDIFACT since they do not pursue international business.

### **Current Status of Protocols**

- A majority of the respondents use VAN's to perform their EDI transfer protocol interface (this may change since carriers are now allowed to perform this function).
- Only one carrier is using MHS X.400.
- No carrier is using FTAM.
- All interconnected with other EDI networks via X.25.

### **Future Trends of Protocols**

- Generally, few trends could be ascertained since development in this area is new and subsequently very proprietary.
- Most carriers are planning to implement MHS X.400 but role out could not be determined. One indicated 1992 or 1993.
- No carrier is planning to use FTAM and all the carriers believe that FTAM is not applicable.





## **Appendix A**

### **Questionnaire 1**



## Questionnaire 1

### Research Survey

#### Examples of EDI Used by North American Telecommunications Carriers

October, 1991

#### Introductory remarks:

My name is Marc Matheson. I am a Project Director for INPUT. We are a leading market research firm and are conducting a research study to evaluate how EDI is used by North American carriers.

The primary goal of this study is to survey telecommunications carriers who use, or are planning to introduce EDI systems which support customer billing. We would also like to gain a general understanding of your other EDI applications to ensure a clear perspective.

We are in the process of surveying principal EDI network service carriers, vendors, and standards associations who use/define standards for EDI systems. Your participation in this survey would provide the necessary information we need to determine industry trends.

In return for your participation, we will send you an executive summary of INPUT's annual assessment and forecast of the use of EDI in the U.S., entitled EDI MARKET 1991 - 1996, and a copy of our EDI newsletter.

The survey should take about 30 minutes to complete plus what ever time it may take to assemble system and network diagrams.

If this is acceptable, when would be a convenient time for us to call you?

\_\_\_\_\_ What is your fax  
telephone number? \_\_\_\_\_

Your cooperation is greatly appreciated. Thank you very much for your time and consideration.





**INPUT Research Survey**  
**Examples of EDI Used by North American**  
**Telecommunications Carriers**  
**October, 1991**

**I. EDI Billing Function**

1.a. Do think your corporate customers would prefer to receive their telephone bills through an EDI format? Yes \_\_\_ No \_\_\_

1.b. Please describe why

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2. How many of your corporate customers would prefer this service today? \_\_\_\_

Could you express that as a percentage of all of your corporate customers? \_\_\_\_

3. How many currently use it to pay your telephone bills? \_\_\_\_

4. How many do you see using this service 5 years from now? \_\_\_\_

5.a. How many of these customers would be willing to go through the expense of starting up an EDI system to process your telephone bills? \_\_\_\_

Further comments

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5.b. What percentage of these customers would utilize the store and forward format? \_\_\_\_

6. Would customers who already have their own EDI system in place be more willing to go through the expense of starting up an EDI system to process your telephone bills?  
Yes \_\_\_ No \_\_\_

Further comments

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7. What is your assessment of the DISA/ANSI ASC X12 811 transaction set which is currently being designed for use by telephone companies to send their bills to customers via EDI?

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8. Would there be any value in coupling this EDI function with a Call Detail Recording (telemangement) system?

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## II. General

1. To insure that we clearly understand your EDI system, could you please forward a high-level copy of your EDI system specifications in the form of block diagrams and/or flow charts, depicting the flow and detail of information exchanged within your EDI service. It would be helpful to understand:
- How materials are ordered
  - How service orders are subsequently generated
  - Billing details
  - Who is contacted
  - How frequently
2. What does your EDI billing system/network configuration look like? Could you please give us a brief description now and then forward a more detailed description in the form of network design/layout diagrams which indicate the type of networks, systems used, etc.
- 3.a. How many users currently utilize your EDI billing system network(s)?

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3.b. What is the maximum number of users that can be supported by each EDI network system?

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4.a. Using the OSI Basic Reference Model, please diagram the top 3 transfer protocols currently support. Are there others? \_\_\_\_\_

OSI Ref. Model	Example A	Example B
Application		MHS
Presentation		X. 226
Session		X. 225
Transport		X. 224
Network	X.25	X. 25
Data Link	HDLC	HDLC
Physical	I.430/I.431	I.430/I.431

OSI Ref. Model	Example 1	Example 2
Application		
Presentation		
Session		
Transport		
Network		
Data Link		
Physical		

OSI Ref. Model	Example 3
Application	
Presentation	
Session	
Transport	
Network	
Data Link	
Physical	





- 4.b. Please rank these top 3 or more protocols by percentage of highest to lowest usage/demand.

Protocol Name	Ranking by %
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- 5.a. Are users expected to pay to use your EDI billing network?

Yes\_\_ No\_\_

- 5.b. May we have a copy of your pricing schedules or something that gives an approximation of what a user might pay for network services?

Yes\_\_ No\_\_

6. What are some of the more significant problems you have experienced with your EDI billing system (or other EDI system) and what methods or approaches are/were used to solve them?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### III. Formats - Billing Systems, Only

1. Do you use:
- \_\_\_ only standard EDI (which includes ANSI X12, EDIFACT, TDCC, WINS, UCS, Petrodex, UB82, and the various implementations of these defined by industry-specific implementation guidelines)

\_\_\_ only proprietary EDI

\_\_\_ both proprietary and standard EDI

2. If you use both proprietary and standard formats, please estimate the relative proportions of each in terms of total data traffic between you and your trading partners.

\_\_\_ % sent via proprietary formats

\_\_\_ % sent via standard



3. How many total trading partners do you have?

- using standard EDI
- using proprietary formats

4. How many trading partners do you expect to have in the next 12 months?

- using standard EDI
- using proprietary formats

#### IV. Formats - All Other Systems

1. In what application area(s) does your company use EDI? (Please indicate in each area whether your EDI system uses standard or proprietary formats and note which standard(s)-- e.g. X12, TDCC, etc.)

Application	Standard	Proprietary
PO's to suppliers	_____	_____
PO's from customers	_____	_____
Invoices from suppliers	_____	_____
Invoices to customers	_____	_____
Transportation documentation (ship notices, etc.)	_____	_____
Payments to/from trading Partners	_____	_____
Other	_____	_____
_____	_____	_____
_____	_____	_____

2. If you do not use and/or are not planning to use EDIFACT, please note why

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3. What standards will you use if you interconnect with other vendors?

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**V. Current Status of Protocols**

- 1.a. What kinds of EDI transfer protocol interfaces are offered to your users and other service vendors, e.g., telephone, X.25, SNA, MHS, etc.

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- 1.b. Why are they offered?

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2. Are you experiencing any problems with these protocols? (Please note any weaknesses and why they do not perform as well.)

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3. What is your assessment of the EDI protocols you offer? (Please note the "why's behind your assessments)

4. Please note the number of companies using each protocol and identify the larger users if possible.

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5. If you are offering MHS protocol:

- a. What version of MHS protocol is used...'84 or '88? (Please circle)
- b. What type of protocol is used...P0, P1, P2, P3, or P7 ('88)? (Please circle)
- c. Is MHS protocol used with customers?

Yes\_\_\_ No\_\_\_ If yes, is it used in general or only with specific customers?

\_\_\_\_\_

If specific, how many? \_\_\_\_\_ %

- d. Is MHS protocol used with network services vendors?

Yes\_\_\_ No\_\_\_

If yes, is it used in general or only with specific vendors?

If specific, how many? \_\_\_\_\_ %

- 6. If you are offering FTAM protocol, what types of file options are used...Type 1, 2, or 3? (Please circle)

- 7. Do you interconnect with other EDI networks?

Yes\_\_\_ No\_\_\_

If yes, please describe the protocol interface.

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## VI. Future Trends of Protocols

- 1.a. What kinds of EDI transfer protocol interfaces are expected to be offered to users and other service vendors?

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1.b. Why are you planning to offer these?

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2. When is the scheduled roll out for these offerings?

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3.a. Are you planning to use MHS protocol? Yes\_\_ No\_\_

3.b. If yes, when would MHS be offered?

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4. If you are planning to offer MHS protocol:

- a. What version of MHS protocol will be used...'84 or '88? (Please circle)  
b. What type of protocol will be used...P0, P1, P2, P3, or P7 ('88)? (Please circle)

c. Will MHS protocol be used with customers?

Yes\_\_ No\_\_ If yes, will it be used in general or only with specific customers?

\_\_\_\_\_

If specific, how many? \_\_\_\_\_ %

d. Will MHS protocol be used with network services vendors? Yes\_\_ No\_\_

If yes, will it be used in general or only with specific vendors? \_\_\_\_\_

If specific, how many? \_\_\_\_\_ %





5.a. Are you planning to offer FTAM? Yes\_\_ No\_\_

5.b. If yes, when would FTAM be offered?

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6. Other comments

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## Appendix B

### 811 Transaction Set



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# Transaction Set Development





***Published June 1991 — DISA***

Suggestions or questions should be directed to:

Data Interchange Standards Association, Inc. (DISA)  
Technical Department  
1800 Diagonal Road • Suite 355  
Alexandria, Virginia 22314  
Phone: (703) 548-7005  
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# 811 Consolidated Service Invoice/Statement

FUNCTIONAL GROUP= C1

This standard provides the format and establishes the data contents of the consolidated services invoice/statement transaction set. This transaction set provides for the billing of complex and structured service invoice detail.

This standard can be used by organizations who are interested in sending or receiving either consolidated or stand alone invoices for service arrangements which require processing other than that of the typical product invoice. An example of its use would be the exchange of telecommunications services invoices which require mechanical auditing prior to payment.

The Consolidated Services Invoice/Statement can be used as a credit/debit memo to differentiate between payable invoice items and information-only memo items. This transaction set should not be used as a stand alone notification of a credit/debit adjustment.

Table 1

POS. NO.	SEG. ID	NAME	REQ. DES.	MAX. USE	LOOP REPEAT	DM#	NOTES & COMMENTS
010	ST	Transaction Set Header	M	1			
020	BIG	Beginning Segment for Invoice	M	1		387290	
030	NTE	Note/Special Instruction	O	100		387290	
040	CUR	Currency	O	1		387290	
050	REF	Reference Numbers	O	>1		387290	
060	PER	Administrative Communications Contact	O	3		387290	
070	ITD	Terms of Sale/Deferred Terms of Sale	O	5		387290	
080	DTM	Date/Time Reference	O	10		387290	
090	TXI	Tax Information	O	>1		387290	
100	N1	Name	O	1	N1/>1	387290	
110	N2	Additional Name Information	O	2		387290	
120	N3	Address Information	O	2		387290	
130	N4	Geographic Location	O	1		387290	
140	REF	Reference Numbers	O	12		387290	
150	PER	Administrative Communications Contact	O	3		387290	

Table 2

POS. NO.	SEG. ID	NAME	REQ. DES.	MAX. USE	LOOP REPEAT	DM#	NOTES & COMMENTS
010	HL	Hierarchical Level	M	1	HL/>1	387290	NTE
020	LX	Assigned Number	O	1	LX/>1	387290	
030	SI	Service Characteristic Identification	O	2		387290	
040	PID	Product/Item Description	O	10		387290	
050	REF	Reference Numbers	O	>1		387290	



## 811 - CONSOLIDATED SERVICE INVOICE/STATEMENT

060	AMT	Monetary Amount	0	5		387290
070	DTM	Date/Time Reference	0	2		387290
080	TXI	Tax Information	0	>1		387290
090	QTY	Quantity	0	1	QTY/10	387290
100	SI	Service Characteristic Identification	0	1		387290
110	N1	Name	0	1	N1/1	387290 NTE
120	N2	Additional Name Information	0	2		387290
130	N3	Address Information	0	2		387290
140	N4	Geographic Location	0	1		387290
150	REF	Reference Numbers	0	2		387290
160	PER	Administrative Communications Contact	0	>1		387290
170	TXI	Tax Information	0	>1		387290
180	ITA	Allowance, Charge or Service	0	1	ITA/>1	387290
190	DTM	Date/Time Reference	0	1		387290
200	TXI	Tax Information	0	>1		387290
210	IT1	Baseline Item Data (Invoice)	0	1	IT1/999999	387290 NTE
220	SI	Service Characteristic Identification	0	2		387290
230	PID	Product/Item Description	0	10		387290
240	INC	Installment Information	0	1		387290
250	TXI	Tax Information	0	>1		387290
260	REF	Reference Numbers	0	1		387290
270	DTM	Date/Time Reference	0	10		387290
280	MSG	Message Text	0	>1		387290
290	QTY	Quantity	0	1	QTY/>1	387290
300	SI	Service Characteristic Identification	0	1		387290
310	ITA	Allowance, Charge or Service	0	1	ITA/10	387290
320	DTM	Date/Time Reference	0	1		387290
330	TXI	Tax Information	0	>1		387290
340	N1	Name	0	1	N1/>1	387290
350	N2	Additional Name Information	0	2		387290
360	N3	Address Information	0	2		387290
370	N4	Geographic Location	0	1		387290
380	PER	Administrative Communications Contact	0	3		387290
390	SLN	Subline Item Detail	0	1	SLN/>1	387290 NTE
400	SI	Service Characteristic Identification	0	2		387290
410	PID	Product/Item Description	0	10		387290





420	CUR	Currency	O	1		387290
430	INC	Installment Information	O	1		387290
440	ITA	Allowance, Charge or Service	O	10		387290
450	TXI	Tax Information	O	>1		387290
460	REF	Reference Numbers	O	>1		387290
470	PER	Administrative Communications Contact	O	3		387290
480	DTM	Date/Time Reference	O	10		387290
490	AMT	Monetary Amount	O	10		387290
500	MSG	Message Text	O	>1		387290
510	QTY	Quantity	O	1	QTY/>1	387290
520	SI	Service Characteristic Identification	O	1		387290
530	N1	Name	O	1	N1/>1	387290
540	N2	Additional Name Information	O	2		387290
550	N3	Address Information	O	2		387290
560	N4	Geographic Location	O	1		387290
570	REF	Reference Numbers	O	2		387290
580	PER	Administrative Communications Contact	O	3		387290
590	TCD	Itemized Call Detail	O	1	TCD/>1	387290 NTE
600	SI	Service Characteristic Identification	O	2		387290
610	TXI	Tax Information	O	>1		387290
620	USD	Usage Sensitive Detail	O	1	USD/>1	387290 NTE
630	ITA	Allowance, Charge or Service	O	2		387290
640	TRF	Rating Factors	O	18		387290
650	QTY	Quantity	O	1	QTY/>1	387290
660	SI	Service Characteristic Identification	O	1		387290

Table 3

POS. NO.	SEG. ID	NAME	REQ. DES.	MAX. USE	LOOP REPEAT	DM#	NOTES & COMMENTS
010	TDS	Total Monetary Value Summary	M	1		387290	
020	ITA	Allowance, Charge or Service	O	1	ITA/>1	387290	
030	DTM	Date/Time Reference	O	1		387290	
040	BAL	Balance Detail	O	1	BAL/>1	387290	
050	DTM	Date/Time Reference	O	1		387290	
060	N1	Name	O	1	N1/>1	387290	
070	BAL	Balance Detail	O	1	BAL/>1	387290	
080	DTM	Date/Time Reference	O	1		387290	



## 811 - CONSOLIDATED SERVICE INVOICE/STATEMENT

090	ITA	Allowance, Charge or Service	O	1	ITA/>1	387290	
100	DTM	Date/Time Reference	O	1		387290	
110	CTT	Transaction Totals	O	1		387290	NTE
120	SE	Transaction Set Trailer	M	1		387290	

## Notes &amp; Comments

Table 2

POS. NO.	TYPE	TEXT
010	NTE	Valid codes for HL03 to define levels for this transaction set are given below: 1 - Service/Billing Provider (Identifies the Company Providing the Service/Billing) 2 - Billing Arrangement (Identifies a Specific Billing Arrangement) 3 - Sub-billing Arrangement (Identifies a More Detailed Billing Arrangement) 4 - Group (Identifies a Group of Charges on the Bill) 5 - Category (Identifies the Subdivision of the Group) 6 - Subcategory (Identifies a Further Breakdown of the Category) 7 - Type (Identifies a Further Breakdown of the Subcategory) 8 - Charge Detail (Identifies the Lowest Level of Charges within a Billing Arrangement) 9 - Line Detail (Identifies the Supporting Detail Associated with the Charge or Group Level) They must be used in the (hierarchical) order in which they are listed; however, certain levels are optional and may be omitted. At least one occurrence each of the service/billing provider level and group level is required.
110	NTE	The service/billing provider level is defined by the N1 loop.
210	NTE	The group level is defined by at least one occurrence of the IT1 loop which may only appear at the group level.
390	NTE	The SLN loop may only appear at the charge detail level.
590	NTE	The TCD loop may only appear at the line detail level.
620	NTE	The USD loop may only appear at the line detail level.

Table 3

POS. NO.	TYPE	TEXT
110	NTE	The number of line items (CTT01) is the accumulation of the number of IT1 segments.



**DM# 387290**

Status: IN VOTING PROCESS

Requestor: LINDA NEWERLA

Company: BELLCORE

Subcommittee(s): F

SEGMENT HEAD				
ACTION	SHARED	SEG ID	NAME	PURPOSE
ADD		INC	Installment Information	To specify installment billing arrangement.
ADD		SI	Service Characteristic Identification	To specify service characteristic data.
ADD		TCD	Itemized Call Detail	To specify detail information for itemized calls.
ADD		TRF	Rating Factors	To specify rating information used to calculate usage sensitive charges.
ADD		USD	Usage Sensitive Detail	To specify usage sensitive details which qualify for discounts or are subject to special rates.

SEGMENT DETAIL					
ACTION	SHARED	SEG ID	SEQ	ELE ID	REQ
ADD		INC	01	336	M
ADD		INC	02	355	M
ADD		INC	03	380	M
ADD		INC	04	380	M
ADD		INC	05	782	O
ADD		ITD	15	954	O
ADD		SI	01	559	M
ADD		SI	02	1000	M
ADD		SI	03	234	M
ADD		SI	04	1000	C
ADD		SI	05	234	C
ADD		SI	06	1000	C
ADD		SI	07	234	C
ADD		SI	08	1000	C
ADD		SI	09	234	C
ADD		SI	10	1000	C
ADD		SI	11	234	C
ADD		SI	12	1000	C
ADD		SI	13	234	C
ADD		SI	14	1000	C
ADD		SI	15	234	C
ADD		SI	16	1000	C
ADD		SI	17	234	C
ADD		SI	18	1000	C
ADD		SI	19	234	C
ADD		SI	20	1000	C
ADD		SI	21	234	C
ADD		TCD	01	350	O
ADD		TCD	02	373	O
ADD		TCD	03	337	O
ADD		TCD	04	309	C
ADD		TCD	05	310	C
ADD		TCD	06	156	O





SEGMENT DETAIL					
ACTION	SHARED	SEG ID	SEQ	ELE ID	REQ
ADD		TCO	07	309	C
ADD		TCO	08	310	C
ADD		TCO	09	156	O
ADD		TCO	10	739	O
ADD		TCO	11	739	O
ADD		TCO	12	782	O
ADD		TCO	13	782	O
ADD		TCO	14	782	O
ADD		TCO	15	782	O
ADD		TRF	01	673	M
ADD		TRF	02	355	M
ADD		TRF	03	380	M
ADD		TRF	04	355	M
ADD		TRF	05	380	M
ADD		TXI	06	441	C
ADD		USD	01	662	M
ADD		USD	02	350	O
ADD		USD	03	359	C
ADD		USD	04	954	C
ADD		USD	05	355	C
ADD		USD	06	380	C
ADD		USD	07	380	O
ADD		USD	08	782	C
ADD		USD	09	362	C
ADD		USD	10	355	O
ADD		USD	11	740	C
ADD		USD	12	741	C
ADD		USD	13	559	C
ADD		USD	14	1000	C
ADD		USD	15	234	C
ADD		USD	16	1000	C
ADD		USD	17	234	C

SEGMENT NOTES						
ACTION	SHARED	SEG ID	TYPE	SEQ	PARA	NOTE
ADD		INC	COM	02	1	INC02 is the installment period (e.g., months). INC03 is the total number of installments. INC04 is the number of the current installment. INC05 is the installment balance after the current installment is applied.
ADD		INC	COM	03	1	
ADD		INC	COM	04	1	
ADD		INC	COM	05	1	
ADD		ITD	COM	15	1	
ADD		SI	SYN	04	1	P0405 — If either SI04 or SI05 is present, then the other is required. P0607 — If either SI06 or SI07 is present, then the other is required. P0809 — If either SI08 or SI09 is present, then the other is required. P1011 — If either SI10 or SI11 is present, then the other is required. P1213 — If either SI12 or SI13 is present, then the other is required.
ADD		SI	SYN	06	1	
ADD		SI	SYN	08	1	
ADD		SI	SYN	10	1	
ADD		SI	SYN	12	1	



## SEGMENT NOTES

ACTION	SHARED	SEG ID	TYPE	SEQ	PARA	NOTE
ADD		SI	SYN	14	1	P1415 — If either SI14 or SI15 is present, then the other is required.
ADD		SI	SYN	16	1	P1617 — If either SI16 or SI17 is present, then the other is required.
ADD		SI	SYN	18	1	P1819 — If either SI18 or SI19 is present, then the other is required.
ADD		SI	SYN	20	1	P2021 — If either SI20 or SI21 is present, then the other is required.
ADD		SI	COM	01	1	SI01 defines the source for each of the service characteristics qualifiers.
ADD		TCD	SYN	04	1	P0405 — If either TCD04 or TCD05 is present, then the other is required.
ADD		TCD	SYN	07	1	P0708 — If either TCD07 or TCD08 is present, then the other is required.
ADD		TCD	COM	01	1	TCD01 is the detail information.
ADD		TCD	COM	02	1	TCD02 is the date of the call.
ADD		TCD	COM	03	1	TCD03 is the connect time of the call.
ADD		TCD	COM	04	1	TCD04, TCD05, and TCD06 are the "to" location of the call.
ADD		TCD	COM	07	1	TCD07, TCD08, and TCD09 are the "from" location of the call.
ADD		TCD	COM	10	1	TCD10 and TCD11 are the total duration of the call. TCD10 is the time measured in minutes or minutes and tenths of minutes. TCD11 is time measured in seconds or seconds and tenths of seconds.
ADD		TCD	COM	12	1	TCD12 is an undiscounted amount.
ADD		TCD	COM	13	1	TCD13 is a net amount after the discount has been applied to the amount in TCD12.
ADD		TCD	COM	14	1	TCD14 is an undiscounted amount.
ADD		TCD	COM	15	1	TCD15 is a net amount after the discount has been applied to the amount in TCD14.
ADD		TRF	COM	01	1	TRF01 defines the rating basis (e.g., acknowledged calls, minimum period, etc.) for the segment.
ADD		TRF	COM	02	1	TRF02 and TRF03 define equivalent units per standard unit.
ADD		TRF	COM	04	1	TRF04 and TRF05 define the standard unit.
ADD		TXI	SYN	01	1	R020306 — At least one of TXI02, TXI03 or TXI06 is required.
ADD		USD	SYN	02	1	E0304 — Only one of USD03 or USD04 may be present.
ADD		USD	SYN	03	1	L03060708 — If USD03 is present, then at least one of USD06, USD07 or USD08 are required.
ADD		USD	SYN	04	1	L040809 — If USD04 is present, then at least one of USD08 or USD09 are required.
ADD		USD	SYN	06	1	C0605 — If USD06 is present, then USD05 is required.
ADD		USD	SYN	07	1	C070506 — If USD07 is present, then USD05 and USD06 are required.
ADD		USD	SYN	10	1	L101112 — If USD10 is present, then at least one of USD11 or USD12 are required.
ADD		USD	SYN	14	1	C1413 — If USD14 is present, then USD13 is required.
ADD		USD	SYN	14	2	P1415 — If either USD14 or USD15 is present, then the other is required.
ADD		USD	SYN	16	1	C1613 — If USD16 is present, then USD13 is required.
ADD		USD	SYN	16	2	C1617 — If USD16 is present, then USD17 is required.
ADD		USD	COM	03	1	If both USD03 and USD08 are present, USD08 takes precedence.





SEGMENT NOTES						
ACTION	SHARED	SEG ID	TYPE	SEQ	PARA	NOTE
ADD		USD	COM	04	1	USD04 is the discount percentage.
ADD		USD	COM	06	1	USD06 is the quantity of usage.
ADD		USD	COM	07	1	USD07 is a quantity of usage different than the quantity in USD06. When USD07 is present, it is used in conjunction with USD06 and then the rate USD03 is applied.
ADD		USD	COM	11	1	If USD11 is present and USD12 is not present, then the range is open-ended.
ADD		USD	COM	12	1	If USD12 is present and USD11 is not present, then the minimum is zero.
ADD		USD	COM	13	1	USD13 defines the source for each of the Service Characteristic Qualifiers.

SIMPLE DATA ELEMENT HEAD				
ACTION	SHARED	ELE ID	NAME	DEFINITION
CHG		337	Time	▲ Time expressed in 24-hour clock time (HHMMSS) (Time range: 000000 through 235959)
ADD		1000	Service Characteristics Qualifier	Code from an industry code list qualifying the type of service characteristics.

SIMPLE DATA ELEMENT DETAIL					
ACTION	SHARED	ELE ID	TYPE	MIN	MAX
CHG		337	TM	4	▲6
CHG		350	AN	1	▲11
ADD		1000	ID	2	2

SIMPLE DATA ELEMENT CODES CROSS REFERENCE						
ACTION	SHARED	ELE ID	PART	CODE	PARA	DEFINITION
ADD		66		40	1	Electronic Mail User Code
ADD		66		41	1	Telecommunications Carrier Identification Code
ADD		66		42	1	Telecommunications Pseudo Carrier Identification Code
ADD		98		C3	1	Circuit Location Identifier
ADD		98		GP	1	Gateway Provider
ADD		98		SJ	1	Service Provider
ADD		128		10	1	Account Managers Code
ADD		128		11	1	Account Number
ADD		128		12	1	Billing Account
ADD		128		13	1	Horizontal Coordinate
ADD		128		14	1	Master Account Number
ADD		128		15	1	Vertical Coordinate
ADD		143		811	1	X12.39 Consolidated Service Invoice/Statement (811)
ADD		150	ACF		1	Access Charge - Federal
ADD		150	ACH		1	Access Charges
ADD		150	ACS		1	Access Charge - State
ADD		150	AMB		1	Adjustment for Maximum Charges Billing
ADD		150	AMP		1	Adjustment for Minimum Average Time Requirement Billing
ADD		150	ANB		1	Adjustment for Minimum Charges Billing
ADD		150	CCR		1	Concession Credit





## SIMPLE DATA ELEMENT/CODES CROSS REFERENCE

ACTION	SHARED	ELE ID	PART	CODE	PARA	DEFINITION
ADD		150		COC	1	Connect Charge
ADD		150		DDS	1	Deaf and Disabled Surcharge
ADD		150		EAC	1	Exchange Access Credit
ADD		150		FTC	1	Federal Transfer Surcharge
ADD		150		GRS	1	Gross Receipts Surcharge
ADD		150		LSS	1	Lifeline Surcharge
ADD		150		MGA	1	Message Rate Adjustment
ADD		150		MGC	1	Message Charge
ADD		150		MUS	1	Municipal Surcharge
ADD		150		ORC	1	Operator Credit
ADD		150		PMC	1	Prior Month Credit
ADD		150		PPU	1	Prepaid Usage Allowance
ADD		150		REE	1	Regulatory Fee
ADD		150		RFD	1	Refund
ADD		150		SAP	1	Service Assistance Program Surcharge
ADD		150		SMS	1	State/Metropolitan Transit Authority Surcharge
ADD		150		STC	1	State Surcharge
ADD		150		TCB	1	Telegram Chargeback
ADD		150		TRS	1	Transferred Charges
ADD		150		UPD	1	Usage Plan Detail Charge
ADD		150		WAT	1	Wide Area Telephone Service (WATS) Usage Credit
ADD		336	18		1	Fixed Date, Late Payment Penalty Applies
ADD		355	AD		1	Bytes
ADD		355	AL		1	Access Lines
ADD		355	CO		1	Calls
ADD		355	DQ		1	Data Records
ADD		355	DY		1	Directory Books
ADD		355	EB		1	Electronic Mail Boxes
ADD		355	H1		1	Half Pages - Electronic
ADD		355	KB		1	Kilocharacters
ADD		355	KF		1	Kilopackets
ADD		355	KJ		1	Kilosegments
ADD		355	MO		1	Magnetic Tapes
ADD		355	NF		1	Messages
ADD		355	NH		1	Message Hours
ADD		355	NJ		1	Number of Screens
ADD		355	PO		1	Pages - Electronic
ADD		355	QA		1	Pages - Facsimile
ADD		355	QB		1	Pages - Hardcopy
ADD		355	QH		1	Quarter Hours
ADD		355	RS		1	Resets
ADD		355	S6		1	Sessions
ADD		355	S7		1	Storage Units
ADD		355	T0		1	Telecommunications Lines in Service



## SIMPLE DATA ELEMENT/CODES CROSS REFERENCE

ACTION	SHARED	ELE ID	PART	CODE	PARA	DEFINITION
ADD		355		UB	1	Telecommunications Lines in Service - Average
ADD		355		UC	1	Telecommunications Ports
ADD		355		UD	1	Tenth Minutes
ADD		355		UE	1	Tenth Hours
ADD		355		UF	1	Usage per Telecommunications Line - Average
ADD		366		BI	1	Bill Inquiry Contact
ADD		366		DA	1	Directory Advertising Contact
ADD		366		MA	1	Maintenance Contact
ADD		378		9	1	Late Payment Charge Base Amount
ADD		441		C	1	Not Taxable
ADD		479		CI	1	Consolidated Service Invoice/Statement (811)
ADD		522		AP	1	Amount Prior to Fractionalization
ADD		522		NS	1	Net Savings Amount
ADD		522		PB	1	Billed Amount
ADD		639		BD	1	Before Discount
ADD		640		CD	1	Consolidated Debit Invoice
ADD		640		CE	1	Consolidated Credit Invoice
ADD		640		CF	1	Consolidated Debit Memo
ADD		640		CG	1	Consolidated Credit Memo
ADD		640		RG	1	Revised Final Bill
ADD		662		O	1	Information Only
ADD		673	90		1	Acknowledged Quantity
ADD		673	91		1	Additional Usage Quantity
ADD		673	92		1	Allotted Usage Quantity
ADD		673	93		1	Attendant-Handled Quantity
ADD		673	94		1	Billable Quantity
ADD		673	95		1	Data Storage Quantity
ADD		673	96		1	Non-Billable Quantity
ADD		673	97		1	Non-Urgent Delivery Quantity
ADD		673	98		1	Overflow Quantity
ADD		673	99		1	Quantity Used
ADD		673	AA		1	Unacknowledged Quantity
ADD		673	AB		1	Urgent Delivery Quantity
ADD		673	AC		1	Voice Storage Quantity
ADD		673	AD		1	Maintenance Units
ADD		673	AE		1	Minimum Average Time Requirement (MATR) Units
ADD		673	AF		1	Wide Area Telephone Service (WATS)/800 Service Units



## SIMPLE DATA ELEMENT/CODES CROSS REFERENCE

ACTION	SHARED	ELE ID	PART	CODE	PARA	DEFINITION
ADD		673		AG	1	Number of End Users
ADD		673		AH	1	Number of Message Recipients
ADD		673		AI	1	Number of Operator Credits
ADD		735		1	1	Service/Billing Provider
ADD		735		2	1	Billing Arrangement
ADD		735		3	1	Sub-Billing Arrangement
ADD		735		4	1	Group
ADD		735		5	1	Category
ADD		735		6	1	Sub-Category
ADD		735		7	1	Type
ADD		735		8	1	Charge Detail
ADD		735		9	1	Line Detail
ADD		951		P	1	Previous Month
ADD		963		CA	1	City Tax
ADD		963		FD	1	Federal Tax
ADD		963		FR	1	Franchise Tax
ADD		963		GR	1	Gross Receipts Tax
ADD		963		GS	1	Goods and Services Tax
ADD		963		HS	1	Health Services Tax
ADD		963		HT	1	Handicap Tax
ADD		963		LO	1	Local Tax (Not Sales Tax)
CHG		963		LT	1	▲Local Sales Tax (All Applicable Sales Taxes by Taxing Authority Below the State Level)
ADD		963		MP	1	Municipal Tax
ADD		963		OT	1	Occupational Tax
ADD		963		SE	1	State Excise Tax
ADD		963		SL	1	State and Local Tax
ADD		963		SP	1	State/Provincial Tax
ADD		963		SU	1	Sales and Use Tax
ADD		963		TD	1	Telecommunications Device for the Deaf (TDD) Service Excise Tax
ADD		963		TT	1	Telecommunications Tax
ADD		963		ZA	1	911-City Tax
ADD		963		ZB	1	911-County Tax
ADD		963		ZC	1	911-Excise Tax
ADD		963		ZD	1	911-State Tax
ADD		963		ZE	1	911-Tax

## SIMPLE DATA ELEMENT/APPENDIX CROSS REFERENCE

ACTION	SHARED	ELE ID	PART	CODE	PARA	APP ID
CHG		66		41	1	A 46
CHG		66		42	1	A 46
CHG		128		15	1	A 46
CHG		235		TY	1	A 46
CHG		559		TI	1	A 46







## SIMPLE DATA ELEMENT/APPENDIX CROSS REFERENCE

ACTION	SHARED	ELE ID	PART	CODE	PARA	APP ID
ADD		1000				A 46

## APPENDIX HEAD

ACTION	SHARED	APP ID	NAME
CHG		A 46	Telecommunications Industry Codes

## APPENDIX NOTES

ACTION	SHARED	APP ID	TYPE	INFO
CHG		A 46	SRC	Telecommunication Industry Forum Guidelines
CHG		A 46	AVL	TCIF Exchange Carriers Standards Association, Secretariat 5430 Grosvenor Lane Suite 200 Bethesda, MD 20814-2122
CHG		A 46	ABS	The guidelines lists the suggested codes to be used in the telecommunications industry. The codes are subsets of the ANSI ASC X12.3, Data Element Dictionary.



## **Appendix C**

### **Telephone Billing Work Group Forum**



**TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals**

**Goal (Output)**

Develop change procedures for the Implementation Guidelines.

**Tasks (Quality Requirement)**

1. Review TCIF procedures for possible revision
2. Review possibility of using RIF as documentation vehicle
3. Develop procedure for handling guideline updates between publications
4. Participate in monitoring the status of full-blown TCIF guidelines

**Indicators**

- (1A) Meeting with M&M to determine current change procedures.
- (2A) Present new procedures to TCIF for approval
- (3A) Present to TBWG and TCIF the DE1000/235/234 change procedures for approval
- (3B) Send appropriate updates to ECSA





TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Develop summing rules for use of IT1

**Tasks (Quality Requirement)**

1. Gather data from all companies regarding summing to the IT1
2. Develop summing rules to sum levels below the IT1 level back to the IT1
3. Develop recommended TBWG use of RIFs that impact the summing rules. This will include specific mapping examples.

**Indicators**

(1A) TBWG approval of summing rules

(2A) Addition of new rules to the 811 Guideline



TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Develop use of 864 in conjunction with the 811

**Tasks (Quality Requirements)**

1. Gather data regarding use of the 864 transaction set
2. Evaluate benefits of using 864 based on data gathered and make recommendation
3. Present to TBWG for approval
4. Do mapping
5. Develop changes to the Implementation Guidelines

**Indicators**

(1A) Obtain TCIF approval



**TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals**

**Goal (Output)**

Establish guidelines for the 997 transaction set in conjunction with the 811

**Tasks (Quality Requirements)**

1. Determine business requirements
2. Determine transaction set requirements
3. Do Mapping
4. Develop implementation guidelines

**Indicators**

- (1A) Obtain and document TBWG consensus
- (2A) Evaluate existing standards
- (2B) Document findings
- (3A) Relate all data supporting business requirements to its X12 equivalent
- (4A) Transfer all documented info into the TCIF guidelines
- (4B) Obtain TCIF approval





TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Establish guidelines for the EDI transaction of the Customer Service Record (CSR) information.

**Tasks (Quality Requirements)**

1. Determine if application of the CSR is a TBWG function.
2. Determine business requirements
3. Determine transaction set requirements - existing vs new
4. Define CSR from customer/client perspective
5. Do Mapping
6. Develop implementation guidelines

**Indicators**

- (1A) Obtain and document TBWG/SOWG consensus
- (2A) Evaluation of existing standards
- (2B) Document findings
- (2C) Determine use of existing vs creating new transaction set
- (3A) Coordination with SOWG and customers to define requirements
- (4A) Relate all data supporting business requirements to its X12 equivalent
- (5A) Transfer all documented information into the TCIF Guidelines
- (5B) Obtain TCIF approval



**TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals**

**Goal (Output)**

Establish guidelines for the transmission of call detail (provided outside of the stand-alone invoice).

**Tasks (Quality Requirements)**

1. Determine business requirements
2. Determine transaction set requirements
3. Do Mapping
4. Develop implementation guidelines

**Indicators**

- (1A) Obtain and document TBWG consensus
- (2A) Evaluate existing standards
- (2B) Document findings
- (3A) Relate all data supporting business requirements to its X12 equivalent
- (4A) Transfer all documented info into the TCIF guidelines
- (4B) Obtain TCIF approval



TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Publish Implementation Guidelines in TCIF world

**Tasks (Quality Requirement)**

1. Distribute ballot to full TCIF membership
2. Increase interest/awareness of guideline package by contacting the TCIF membership

**Indicators**

- (1A) Guidelines distributed to ECSA by September 19
- (1B) Voting package distributed to membership two weeks later
- (2A) Sufficient ballot responses received by deadline
- (2B) TCIF approval of guidelines
- (2C) Publication and distribution of guidelines by Washington Publication





TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Develop a training package for the 811 transaction set

**Tasks (Quality Requirement)**

1. Research and define curriculum
2. Develop education package
3. Determine how package is to be delivered

**Indicators**

- (1A) Present recommendations to TBWG and obtain agreement
- (1B) Assign a sub-group to work on the education package
- (2A) Draft package for group review
- (3A) TBWG agreement on delivery methods



TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Strengthen representation on the other EDI work groups

**Tasks (Quality Requirements)**

1. Identify work groups where representation is needed
2. Identify representatives to act as liaisons
3. Define role of the liaison
4. Communicate with other work groups' expectations of liaison role

**Indicators**

(1A) Identified liaisons

(2A) Published list of liaison representatives

(2B) Published list of roles and responsibilities

(3A) Informal liaison report on TBWG agenda



TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Provide RIF resolution in a timely manner

**Tasks (Quality Requirements)**

1. Define appropriate mandatory turn-around time for a RIF response
2. Determine minimum amount of time that will be dedicated to resolution of RIFs at each meeting
3. Firmly enforce current RIF procedures (e.g., business case, bill example)
4. Review & recommend resolution to all incoming RIFs in a TBWG sub-group
5. Obtain TBWG agreement on all RIF recommendations

**Indicators**

(1A) RIFs being worked in agreed upon time frame

(5A) Agreement of RIF recommendation by TBWG





TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals

**Goal (Output)**

Standardize RIF procedures among TCIF/EDI Subcommittees and work groups

**Tasks (Quality Requirements)**

1. Form a TBWG sub-group to lead the effort in standardization of RIF procedures
2. Work with other subcommittee reps to attain concurrence on the proposed procedures
3. Obtain full EDI approval of new RIF procedures

**Indicators**

- (1A) Subcommittee concurrence of procedures
- (2A) Full TCIF/EDI concurrence of procedures



**TeleCommunication Industry Forum  
Electronic Data Interchange  
Telephone Bill Work Group  
1991 and 1992 Goals**

**Goal (Output)**

Develop a recommendation on TBWG involvement with access billing

**Tasks (Quality Requirements)**

1. Gather input from access billing experts within each affected company
2. Write a recommendation with explanation of decision

**Indicators**

(1A) Agreement from TBWG on recommendations



## Appendix D

### Other EDI Transaction Sets





## 850

## Purchase Order

FUNCTIONAL GROUP ID - PO

This standard provides the format and establishes the data contents of a purchase order transaction set. The purchase order transaction set provides for customary and established business and industry practice relative to the placement of purchase orders for goods and services. This transaction set should not be used to convey purchase order changes or purchase order acknowledgment information.

Table 1

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
ST	Transaction Set Header	M	1			
BEG	Beginning Segment for Purchase Order	M	1			
NTE	Note/Special Instruction	F	100			
CUR	Currency	O	1			
REF	Reference Numbers	O	12			
PER	Administrative Communications Contact	O	3			
TAX	Sales Tax Reference	O	3			
FOB	F.O.B. Related Instructions	O	1			
CTP	Pricing Information	O	25			
SSS	Special Services	O	25			
CSH	Header Sale Condition	O	1			
ITA	Allowance, Charge or Service	O	10			
ITD	Terms of Sale/Deferred Terms of Sale	O	5		667	
DTM	Date/Time Reference	O	10			
LDT	Lead Time	O	12		139	
SHH	General Schedule	O	5			
PRN	Product ID Numbers	O	5		233	
PID	Product/Item Description	O	200			
MEA	Measurements	O	40			
PWK	Paperwork	O	25			
PKG	Marking, Packaging, Loading	O	25			
TD1	Carrier Details (Quantity and Weight)	O	2			
TD5	Carrier Details (Routing Sequence/Transit Time)	O	12			
TD3	Carrier Details (Equipment)	O	12			
TD4	Carrier Details (Special Handling/Hazardous Materials)	O	5			
MAN	Marks and Numbers	O	10			
N9	Reference Number	O	1	N9/1000	110288	
MSG	Message Text	O	1000		110288	
N1	Name	O	1	N1/200	233	Loop N1 is optional, but, if used, segment N1 is mandatory.
N2	Additional Name Information	O	2		233	
N3	Address Information	O	2		233	
N4	Geographic Location	O	1		233	
REF	Reference Numbers	O	12		233	
PER	Administrative Communications Contact	O	3		233	
FOB	F.O.B. Related Instructions	O	1		233	
TD1	Carrier Details (Quantity and Weight)	O	2		233	
TD5	Carrier Details (Routing Sequence/Transit Time)	O	12		233	
TD3	Carrier Details (Equipment)	O	12		233	



TD4	Carrier Details (Special Handling/Hazardous Materials)	O	5	233
PKG	Marking, Packaging, Loading	O	25	233

Table 2

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
PO1	Purchase Order Baseline Item Data	M	1	PO1/100000		At least one occurrence of loop PO1 is required.
CUR	Currency	O	1			
PO3	Additional Item Detail	O	25			
CTP	Pricing Information	O	25			
PID	Product/Item Description	O	1000		086188	
MEA	Measurements	O	40			
PWK	Paperwork	O	25			
PKG	Marking, Packaging, Loading	O	25			
PO4	Item Physical Details	O	1			
REF	Reference Numbers	O	12			
PER	Administrative Communications Contact	O	3			
SSS	Special Services	O	25			
ITA	Allowance, Charge or Service	O	10			
IT8	Conditions of Sale	O	1			
ITD	Terms of Sale/Deferred Terms of Sale	O	2			
TAX	Sales Tax Reference	O	3			
FOB	F.O.B. Related Instructions	O	1			
SDQ	Destination Quantity	O	500			
IT3	Additional Item Data	O	5		637	
DTM	Date/Time Reference	O	10			
LDT	Lead Time	O	12		139	
SCH	Line Item Schedule	O	104			The SCH segment is used to specify various quantities of items ordered that are to be scheduled. When this segment is used the unit of measurement code (SCH02) should always be identical to the unit of measurement code in the associated PO1 segment (PO103). The sum of values of quantity (SCH01) should always equal the quantity ordered (PO102) in the PO1 segment.
TD1	Carrier Details (Quantity and Weight)	O	1			
TD5	Carrier Details (Routing Sequence/Transit Time)	O	12			
TD3	Carrier Details (Equipment)	O	12			
TD4	Carrier Details (Special Handling/Hazardous Materials)	O	5			
MAN	Marks and Numbers	O	10			
AMT	Monetary Amount	O	1		159288	
SLN	Subline Item Detail	O	1	SLN/1000	596	Loop SLN is optional, but, if used, segment SLN is mandatory.
PID	Product/Item Description	O	1000		086188	
PO3	Additional Item Detail	O	104		596	
N9	Reference Number	O	1	N9/1000	110288	
MSG	Message Text	O	1000		110288	



N1	Name	O	1	N1/200	233	Loop N1 is optional, but, if used, segment N1 is mandatory.
N2	Additional Name Information	O	2		233	
N3	Address Information	O	2		233	
N4	Geographic Location	O	1		233	
REF	Reference Numbers	O	12		233	
PER	Administrative Communications Contact	O	3		233	
FOB	F.O.B. Related Instructions	O	1		233	
TD1	Carrier Details (Quantity and Weight)	O	2		233	
TD5	Carrier Details (Routing Sequence/Transit Time)	O	12		233	
TD3	Carrier Details (Equipment)	O	12		233	
TD4	Carrier Details (Special Handling/Hazardous Materials)	O	5		233	
PKG	Marking, Packaging, Loading	O	25		233	

Table 3

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
CTT	Transaction Totals	M	1			The number of line items (CTT01) is the accumulation of the number of PO1 segments. If used, hash total (CTT02) is the sum of the value of quantities ordered (PO102) for each PO1 segment.
AMT	Monetary Amount	O	1		159288	
SE	Transaction Set Trailer	M	1			





## 820

## Payment Order/Remittance Advice

FUNCTIONAL GROUP ID - RA

This standard provides the format and establishes the data contents of a payment order/remittance advice transaction set. The payment order/remittance advice transaction set can be used for three different purposes: (1) to order a financial institution to make payment to payee(s) on behalf of the sending party, (2) to report the completion of a payment to payee(s) by a financial institution, and (3) to give advice to the payee by the payor on the application of a payment made with the payment order or by some other means. This standard is not designed for exception reporting from the financial institution to either party.

Table 1

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
ST	Transaction Set Header	M	1			
BPS	Beginning Segment for Payment Order/Remittance Advice	M	1			
NTE	Note/Special Instruction	F	100			
CUR	Currency	O	1			
REF	Reference Numbers	M	5			
DTM	Date/Time Reference	M	10			
N1	Name	O	1	N1/200		Loop N1 is optional but, if used, segment N1 is mandatory.
N2	Additional Name Information	O	2			
N3	Address Information	O	2			
N4	Geographic Location	O	1			
REF	Reference Numbers	O	12			
PER	Administrative Communications Contact	O	3			

Table 2

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
LS	Loop Header	M	1			
N1	Name	M	1	N1/10000		
RMT	Remittance Advice	M	1	RMT/10000		
CUR	Currency	O	1			
REF	Reference Numbers	O	5			
DTM	Date/Time Reference	O	10			
LE	Loop Trailer	M	1			

Table 3

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
SE	Transaction Set Trailer	M	1			





# 997 Functional Acknowledgment

FUNCTIONAL GROUP ID - FA

The purpose of this standard is to define the control structures for a set of acknowledgments to indicate the results of the syntactical analysis of the electronically encoded documents. The encoded documents are the transaction sets, which are grouped in functional groups, used in defining transactions for business data interchange. This standard does not cover the semantic meaning of the information encoded in the transaction sets.

Seg. ID	Name	Req. Des.	Max. Use	Loop Repeat	DM No.	Comments
ST	Transaction Set Header	M	1			
AK1	Functional Group Response Header	M	1			
AK2	Transaction Set Response Header	O	1	AK2/999999		Loop AK2 is optional, but, if used, segment AK2 is mandatory.  Loop AK3 is optional, but, if used, segments AK2 and AK3 are mandatory.
AK3	Data Segment Note	O	1	AK3/999999		
AK4	Data Element Note	O	99			
AK5	Transaction Set Response Trailer	O	1			
AK9	Functional Group Response Trailer	M	1			
SE	Transaction Set Trailer	M	1			







